

reported in the Straits of Belle Isle, and during the last two days of the month vessels were detained in the Straits by heavy field ice.

As compared with the ice record for May, 1888, the southern limit of ice was about two degrees farther north, while the eastern limit was extended about two degrees. The breaking up of ice to the northward of Newfoundland permitted vessels to effect the passage of Belle Isle Straits during the latter half of the month. Small differences are shown in the aggregate quantity of ice reported along the east and south coasts of Newfoundland and over the Grand Banks.

As compared with the corresponding month of previous years, the southward movement of ice massed to the northward of Newfoundland and along the coast of Labrador has been seasonable, the records showing that the Belle Isle Straits route has usually been available during June. Along the east and south coasts of Newfoundland the ice corresponded closely in quantity with the June average; over the Banks of Newfoundland it was deficient. The southernmost ice reported was over three degrees north of the average southern limit for the month, while the easternmost position in which ice was observed was about one and one-half degrees west of the average eastern limit.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported during the last six years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
June, 1883.....	40 28	51 45	June, 1883.....	48 14	42 43
June, 1884.....	40 42	47 49	June, 1884.....	44 00	45 23
June, 1885.....	39 38	48 12	June, 1885.....	45 14	41 12
June, 1886.....	40 30	53 00	June, 1886.....	49 15	40 00
June, 1887.....	40 40	48 34	June, 1887.....	43 22	39 19
June, 1888.....	43 38	43 24	June, 1888.....	43 38	43 24

FOG.

The limits of fog-belts to the westward of the fortieth meridian are shown on chart i by dotted shading. As compared with the chart of the preceding month, the southern limit of the Newfoundland fog-belt has contracted about one degree, and the number of days for which fog was reported, twenty-three, was six more than the aggregate number of foggy days reported for the preceding month. To the westward of the sixtieth meridian fog was reported for a total of twenty-four days, as compared with twenty-seven days for May.

During the prevalence of fog near Newfoundland, south to east winds preceding or attending the passage of cyclonic areas were noted on sixteen dates; in five instances the winds

were variable, with high barometric pressure, and on two days northwest winds prevailed, with rising barometer. To the southward of Nova Scotia, and off the middle Atlantic coast of the United States, the development of fog was, as a rule, dependent upon the cyclonic circulation of the winds, whereby the moisture laden air from over the Gulf Stream was drawn into that region.

The following are the limits of fog-areas on the north Atlantic Ocean during June, 1888, as reported by shipmasters:

Date.	Vessel.	Entered.			Cleared.		
		Lat. N.	Lon. W.	Time.	Lat. N.	Lon. W.	Time.
1	S. S. Trave.....	40 49	50 40	3 a. m.	40 55	50 30	8 a. m.
1	Brittania.....	40 20	73 07	8 a. m.	New York..		
1-2	Siberian.....	48 00	49 00	6 a. m.	46 30	54 30	2 p. m.
2	Trave.....	41 35	50 00	6 a. m.	41 47	48 20	9-30 a. m.
2	Fog at Saint John's, N. F.						
2-3	S. S. La Gascogne.....	40 30	67 27	7-32 p. m.	40 28	70 47	7-16 a. m.
2-3	Waesland.....	41 35	45 13	10-55 p. m.	40 51	47 07	8-10 a. m.
3	City of Berlin.....	43 43	41 10	11-45 a. m.	43 17	41 48	2-45 p. m.
4-5	Norrna.....	48 24	62 12	6-50 a. m.	46 18	60 05	6-40 a. m.
4-5	City of Berlin.....	41 35	45 22	4-12 a. m.	40 54	48 00	1-12 p. m.
6	Fog at Saint John's, N. F.						
6	Gellert.....	42 05	48 05		41 28	49 28	
7	S. S. Mair.....	41 54	52 49	3-31 a. m.	42 04	51 15	9-25 a. m.
7-8	Wieland.....	40 32	70 24	11-30 p. m.	40 37	70 00	1 a. m.
8	State of Nebraska.....	47 43	45 53	6 a. m.	46 25	49 05	6-45 p. m.
8	Sch. Nelson Bartlett.....	38 39	72 30	3 a. m.	38 56	72 12	4 p. m.
8	Fog at Saint John's, N. F.						
8	S. S. La Normandie.....	41 50	53 18	4 p. m.	41 35	55 28	
9	Colorado.....	Sandy Hook.					
9	Istrian.....	42 08	59 45	5 a. m.	42 53	63 12	7-20 p. m.
9	Eider.....	42 40	49 20	3-10 a. m.	42 18	53 11	2-33 p. m.
10	Fog at Saint John's, N. F.						
10	S. S. Hekla.....	40 19	71 50		40 24	68 10	
10-11	Rotterdam.....	42 09	45 48	3-02 p. m.	41 00	49 03	5-16 a. m.
11	Baltimore.....	40 12	67 20	10 a. m.	40 06	68 25	5-15 p. m.
11-12	Nova Scotian.....	Halifax		8 a. m.	43 02	64 39	4-18 a. m.
11-12	Fog at Saint John's, N. F.						
12	S. S. Rhaetia.....	44 20	44 10	6 a. m.	43 54	48 20	9 p. m.
12-13	Pavonia.....	10' E. Boston.		Light.	42 17	64 25	
13	Rhaetia.....	43 35	54 00	5 a. m.	42 58	54 35	Midnight.
13-14	Hekla.....	42 42	52 55		42 56	51 50	
15-16	Fog at Saint John's, N. F.						
15-16	S. S. Pavonia.....	41 58	52 12	2 p. m.	42 00	48 35	6 a. m.
15-16	Denmark.....	40 54	68 10		40 44	69 05	
16	Galileo.....	41 21	45 34	1-30 a. m.	40 31	48 32	4 p. m.
16-17	Minnesota.....	43 00	59 00	8 a. m.	42 00	65 00	Noon.
17	Venetian.....	43 11	50 51	8 a. m.	42 50	54 58	Midnight.
17	Eider.....	40 25	69 50	4-20 p. m.	40 22	67 30	12-30 p. m.
18	Samara.....	42 43	62 18	7 a. m.	42 40	63 55	1-40 p. m.
18-19	Sch. Annie G. O'Leary.....	43 39	61 02	noon.	41 36	60 53	Noon.
19	S. S. Buffalo.....	42 12	59 35	2-30 a. m.	42 16	60 14	5 a. m.
20	Trave.....	40 50	68 40	6 p. m.	Sandy Hook.		
22	Borderer.....	42 18	68 00		42 20	69 30	
22-23	Chateau Lafite.....	40 33	67 40		40 31	70 40	
23	P. Calland.....	42 46	57 20	4-22 p. m.	42 52	56 19	7-46 p. m.
23	La Bretagne.....	41 10	68 20	4 a. m.	40 55	69 40	4 p. m.
23-24	Germanic.....	42 10	51 00	6-30 p. m.	43 00	48 45	1-30 a. m.
24-25	Rugia.....	40 57	64 00	4 p. m.	40 33	70 28	8 p. m.
25	Elbe.....	41 15	61 50	4 a. m.	41 10	62 10	5-10 a. m.
25-26	Westernland.....	40 29	67 33	6-15 p. m.	40 36	70 21	4-15 a. m.
26	Brittania.....	43 48	49 10	10-48 a. m.	43 27	50 19	Noon.
27	City of Richmond.....	41 41	48 20	11-15 a. m.	41 14	49 20	3-15 p. m.
27-28	Brittania.....	41 52	54 20	1 p. m.	41 44	57 30	9 a. m.
28-29	Bavarian.....	44 00	44 54	4 a. m.	42 50	48 50	2 a. m.
30	Bothnia.....	42 21	67 12		42 22	67 51	

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for June, 1888, is exhibited on chart ii by dotted isothermal lines. In the table of miscellaneous data are given the monthly mean temperatures, with the departures from the normal, for the various stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal, and subtracting when above.

The temperature was above the normal in the central and southern Rocky Mountain and plateau districts, in the lower lake region, Saint Lawrence and Ohio valleys, and in portions of the upper lake region, New England, middle and south Atlantic states; the greatest excess of temperature occurring over the region to the north of Lakes Erie and Huron, and in

western Texas and New Mexico. Elsewhere the month was colder than the average June, the deficiencies of temperature being greatest in northern California and southern Oregon, in the northern portions of Montana and Dakota, and in the lower Mississippi valley and west Gulf states.

The following are some of the most marked departures from normal temperatures at Signal Service stations:

Above normal.		Below normal.	
Santa Fe, N. Mex	3.1	Sacramento, Cal.....	4.0
El Paso, Tex.....	3.0	Rio Grande City, Tex.....	3.8
Fort Elliott, Tex.....	2.6	Roseburg, Oregon.....	3.7
Cheyenne, Wyo.....	2.3	New Orleans, La.....	3.7
Yuma, Ariz.....	1.6	San Antonio, Tex.....	3.0
Denver, Colo.....	1.4	San Francisco, Cal.....	3.0
Prescott, Ariz.....	1.4	Shreveport, La.....	2.8

It will be observed from the above table of extreme depart-

ures that with regard to mean temperature the month cannot be rated as exceptional. Over a large part of the country it has closely approached a normal June.

The highest temperature reported from Signal Service stations during the month was 110°, which occurred at Fort McDowell, Ariz. on the 16th and 17th; the lowest, 18°, occurred on the summit of Pike's Peak, Colo., on the 21st, the next lowest being 24°.8 at Saint Vincent, Minn., on the 1st. The highest monthly mean temperature, 85°.6, occurred at Yuma, Ariz., and, with the exception of 35°.1 on the summit of Pike's Peak, Colo., the lowest was 53°.8 at Duluth, Minn. The maximum temperatures which occurred between the 23d and 25th in New England and the middle Atlantic states were unusually high for this month in those districts, and at a number of stations were the highest that have been recorded since their establishment; that at Eastport, Me., on the 23d, 88°, was 6° higher than the previous June maximum of sixteen years, 82°, which occurred in 1884. Unusually high temperatures were also recorded in the Lake region and Ohio Valley from the 17th to 20th, Grand Haven, Mich., reporting 90°.5 on the 18th, which is 2°.5 higher than the previous June maximum (88° in 1874) of 16 years. The maximum temperature at Denver, Colo., on the 28th, 97°.7; was within 1°.3 of the highest previously recorded in June at that station during the last seventeen years.

The minimum temperatures of the 1st and 2d in the extreme northwest, upper Mississippi valley, and upper lake region closely approached, and at a few stations exceeded, the lowest recorded in previous years. The same may be said of the minimum temperatures in the east Gulf states on the 4th. The minimum temperatures at the following stations were lower than any formerly recorded: Saint Vincent, Minn.; Des Moines, Iowa; Grand Haven Mich.; Sandusky, Ohio; Mobile and Montgomery, Ala.

Table of comparative maximum and minimum temperatures for June.

State or Territory.	Stations.	For 1888.		Since establishment of station.				Length of record.
		Max.	Min.	Max.	Year.	Min.	Year.	
Alabama.....	Mobile.....	90.1	60.0	100.0	1882	61.0	1879	18
Do.....	Montgomery.....	93.6	55.8	105.5	1881	58.0	1879	16
Arizona.....	Prescott.....	89.0	37.4	102.0	1878	32.0	1880	13
Do.....	Fort Apache.....	95.5	42.1	102.0	1887	33.3	1885	10
Arkansas.....	Do.....	93.2	56.0	101.0	1882	50.0	1882	6
Do.....	Fort Smith.....	92.5	56.0	98.0	1882	55.0	1882	9
California.....	Do.....	79.9	53.2	95.2	1883	48.0	1871	18
Do.....	San Francisco.....	76.2	54.0	94.0	1877	50.0	1884	17
Colorado.....	Do.....	97.7	41.0	99.0	1873	37.0	1883	17
Do.....	Denver.....	91.8	37.0	92.6	1887	38.2	1885	4
Connecticut.....	Montrose.....	94.1	47.5	92.0	1880	41.4	1884	16
Do.....	New Haven.....	91.8	50.0	89.0	1880	43.0	1884	17
Dakota.....	Do.....	99.6	36.0	107.0	1883	30.0	1883	10
Do.....	New London.....	95.4	42.8	97.0	1876	38.0	1876, 1879	16
Dis. of Columbia.....	Do.....	94.1	51.6	102.5	1874	46.5	1873	18
Florida.....	Washington City.....	95.8	63.5	100.5	1880	61.7	1884	17
Do.....	Jacksonville.....	88.8	73.1	99.8	1886	68.6	1887	17
Georgia.....	Do.....	93.2	35.3	97.0	1887	54.0	1879	10
Do.....	Atlanta.....	95.8	60.0	100.0	1880	58.5	1884	18
Idaho.....	Savannah.....	90.0	39.6	98.6	1885	30.0	1882	11
Illinois.....	Bois City.....	89.1	51.4	96.0	1872	50.0	1877	17
Do.....	Cairo.....	90.0	43.0	98.0	1872	40.0	1875	16
Indiana.....	Chicago.....	96.4	45.3	96.0	1874	41.1	1885	16
Indian Ter.....	Indianapolis.....	96.5	54.8	105.0	1881	47.0	1879	11
Iowa.....	Fort Sill.....	89.3	42.0	98.0	1881	40.0	1877	15
Do.....	Dubuque.....	88.0	43.4	101.4	1886	43.9	1885	10
Kansas.....	Do.....	96.3	50.0	102.0	1880	40.0	1879	14
Do.....	Dodge City.....	96.2	47.8	99.0	1875	45.0	1882	16
Kentucky.....	Leavenworth.....	98.5	51.5	100.0	1874	49.0	1875	16
Louisiana.....	Louisville.....	93.2	66.5	97.0	1881	65.0	1879	18
Do.....	New Orleans.....	97.0	62.0	104.0	1875	55.0	1877	16
Maine.....	Shreveport.....	88.0	40.3	82.0	1884	30.0	1875	16
Do.....	Eastport.....	96.5	45.0	94.0	1878	42.0	1875	17
Maryland.....	Do.....	93.9	50.7	97.5	1874	49.0	1873	16
Massachusetts.....	Baltimore.....	96.2	49.0	98.0	1874	42.0	1884	18
Michigan.....	Boston.....	93.6	34.6	95.0	1879	31.0	1881	15
Do.....	Marquette.....	90.5	39.0	88.0	1883	39.3	1885	16
Minnesota.....	Do.....	91.3	24.0	93.0	1874	29.0	1883	8
Do.....	Saint Vincent.....	88.7	41.0	94.0	1874	36.0	1885	16
Mississippi.....	Vicksburg.....	92.6	60.0	101.0	1881	53.0	1879	16
Missouri.....	Do.....	89.5	50.0	99.0	1881	48.0	1877	18
Do.....	Saint Louis.....	90.6	31.8	101.0	1883	31.0	1889	7
Montana.....	Ft. Assinaboine.....	90.0	39.5	95.0	1886	31.0	1880	9
Do.....	Helena.....	98.5	42.0	101.0	1876	33.0	1876	14
Nebraska.....	Do.....	96.2	46.4	98.0	1881	42.0	1877	16
Do.....	North Platte.....	87.7	38.7	97.7	1880	29.0	1880	9
Nevada.....	Omaha.....	90.5	50.4	89.0	1881	45.0	1878	15
New Jersey.....	Winnemucca.....	87.0	41.5	92.0	1878	33.0	1877, 1880	15
New Mexico.....	Atlantic City.....	86.0	45.0	92.0	1875	40.5	1879	16
New York.....	Santa Fe.....	96.2	52.2	95.0	1887	47.0	1878, 1879	17
Do.....	Buffalo.....	98.0	53.5	101.9	1880	51.5	1884	10
North Carolina.....	New York City.....	93.8	52.8	100.0	1880	51.0	1884	18
Do.....	Charlotte.....							
Do.....	Wilmington.....							

Table of comparative maximum and minimum temperatures, &c.—Cont'd.

State or Territory.	Stations.	For 1888.		Since establishment of station.				Length of record.
		Max.	Min.	Max.	Year.	Min.	Year.	
Ohio.....	Cincinnati.....	96.5	48.4	98.5	1874	48.0	1885	17
Do.....	Sandusky.....	93.4	44.0	96.0	1885	45.9	1885	9
Oregon.....	Portland.....	87.0	47.5	99.0	1876	39.0	1875	16
Do.....	Roseburg.....	86.0	44.0	97.1	1887	37.5	1880	11
Pennsylvania.....	Pittsburg.....	95.2	41.4	98.0	1874	39.0	1879	16
Do.....	Philadelphia.....	97.2	52.2	97.0	1874	47.2	1884	18
Rhode Island.....	Block Island.....	82.6	49.0	82.6	1884	46.2	1884	8
South Carolina.....	Charleston.....	94.8	62.0	100.0	1880	57.4	1887	16
Tennessee.....	Knoxville.....	95.0	49.7	96.0	1880, 1887	47.0	1878	17
Do.....	Memphis.....	93.6	53.8	100.0	1881	54.0	1879	16
Texas.....	Brownsville.....	92.4	67.0	102.0	1878	63.0	1877	13
Do.....	Fort Elliott.....	99.6	53.0	100.0	1880, 1881	44.0	1880, 1882	9
Utah.....	Salt Lake City.....	92.7	45.1	100.0	1883	37.0	1875	15
Virginia.....	Lynchburg.....	96.5	49.7	97.7	1887	49.0	1880	16
Do.....	Norfolk.....	95.6	55.5	102.0	1874	53.0	1884	18
Washington.....	Spokane Falls.....	84.9	44.0	95.4	1883	38.2	1887	8
Do.....	Olympia.....	82.0	42.0	95.0	1878	36.0	1880	11
Wisconsin.....	La Crosse.....	90.4	44.0	98.0	1874	40.0	1876	16
Do.....	Milwaukee.....	87.1	40.5	94.0	1874	39.8	1885	16
Wyoming.....	Cheyenne.....	92.6	36.8	97.0	1880, 1881	28.0	1876	18

RANGES OF TEMPERATURE.

The monthly and the greatest and least daily ranges of temperature at Signal Service stations are given in the table of miscellaneous meteorological data. The monthly ranges were greatest, and exceeded 60°, in the extreme northwest and upper Missouri valley; they were, as usual, least along the Gulf and Pacific coasts, where they were below 30°.

The following are some of the extreme monthly ranges:

Greatest.		Least.	
Moorhead, Minn.....	70.0	Key West, Fla.....	15.0
Poplar River, Mont.....	68.8	Tatoosh Island, Wash.....	15.7
Saint Vincent, Minn.....	66.5	Galveston, Tex.....	20.6
Fort Yates, Dak.....	65.4	Jupiter, Fla.....	20.6
Bismarck, Dak.....	64.4	Fort Canby, Wash.....	21.5
Fort Buford, Dak.....	63.3	San Diego, Cal.....	22.2
Fort Totten, Dak.....	62.9	Corpus Christi, Tex.....	22.7

FROST.

Frosts are reported to have occurred as follows:

Arizona: Whipple Barracks, 8th. California: Fort Bidwell, 18th. Colorado: Pike's Peak, 11th. Dakota: Fort Totten, 1st, 6th; Bismarck, Fort Yates, and Huron, 6th. Illinois: Oswego, 2d, 3d; Chicago and Rockford, 3d. Indiana: Terre Haute, 2d to 4th; Vevay, 4th. Iowa: Grinnell and Sac City, 1st; Dubuque, 1st, 11th; Amana, Ames, Des Moines, Elkhart, Fairfield, Glenwood, Monticello, Osage, Osceola, Oskaloosa, and Vinton, 2d. Michigan: Traverse City, 1st, 2d; Birmingham and Mottville, 1st, 3d; Kalamazoo, 2d; Grand Haven, 2d, 11th; Hudson and Port Huron, 3d. Minnesota: Moorhead, 1st, 2d; Saint Vincent, 6th; Frankford, 3d. Montana: Fort Maginnis, 6th, 24th. Nevada: Carson City, 4th, 16th, 18th, 20th, 29th. New Hampshire: Mount Washington, 27th, 28th. New York: Palermo, 2d to 4th, 8th; Eden, 3d; Humphrey, 3d, 4th. Ohio: Napoleon and Toledo, 1st, 3d; North Lewisburg and Wauseon, 1st, 3d, 4th; Tiffin and Westerville, 3d; Elyria, Garrettsville, and Lordstown, 3d, 4th, 12th; Bellevue, 12th, 13th. Oregon: Fort Klamath, 5th, 30th; Lakeview and Linkville, 30th. Pennsylvania: Wellsborough, 2d to 5th, 12th; Oatawissa, Grampian Hills, Pittsburg, and Salem Corners, 4th; Dyberry, 4th, 5th; Eastbrook, 4th, 12th. Vermont: Strafford, 3d, 4th, 12th; Northfield, 4th, 12th; Middlebury, 12th; Lunenburg, 30th. West Virginia: Parkersburg, 3d, 4th. Wisconsin: Deuster and Embarras, 2d; Delavan, 2d, 3d. Wyoming: Fort Bridger, 6th; Cheyenne, 10th.

DEVIATIONS FROM NORMAL TEMPERATURES.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperatures for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for June, 1888; (4) the departures of the current month from the normal;

(5) and the extreme monthly means for June during the period of observations and the year of occurrence:

State and Station.	County.	(1) Normal for the month of June.	(2) Length of record.	(3) Mean for June, 1888.	(4) Departure from normal.	(5) Extreme monthly mean temperature for June.			
						Highest.		Lowest.	
						Am't.	Year.	Am't.	Year.
Arkansas.		°	Years	°	°	°		°	
Lead Hill.....	Boone.....	75.8	6	76.1	+0.3	80.2	1885	75.4	1886
California.									
Sacramento.....	Sacramento.....	70.2	22	66.8	-3.4	77.6	1876	66.2	1884
Connecticut.									
Southington.....	Hartford.....	66.0	20	69.0	+3.0	72.7	1870	63.5	1878
Florida.									
Merritt's Island.....	Brevard.....	79.5	5	78.3	-1.2	80.6	1884	78.3	1888
Illinois.									
Greenville.....	Bond.....	74.7	10	71.8	-2.9				
Golconda.....	Pope.....	74.4	10	73.6	-0.8				
Peoria.....	Peoria.....	73.5	32	74.4	+0.9				
Riley.....	McHenry.....	66.6	27	66.7	+0.1				
Indiana.									
Blue Lick.....	Clark.....	71.6	11	70.2	-1.4				
Logansport.....	Cass.....	74.0	34	75.2	+1.2				
Vevay.....	Switzerland.....	74.1	21	74.2	+0.1				
Iowa.									
Cresco.....	Howard.....	66.2	16	67.8	+1.6				
Independence.....	Buchanan.....	67.5	12	68.5	+1.0	71.0	1887		
Monticello.....	Jones.....	68.4	34	69.9	+1.5	74.0	1856	64.1	1863
Kansas.									
Lawrence.....	Douglas.....	73.6	21	73.1	-0.5	77.2	1881	69.8	1878
Wellington.....	Sumner.....	74.1	10	75.5	+1.4	78.7	1881	71.3	1883
Louisiana.									
Grand Coteau.....	Saint Landry.....	78.7	6	76.7	-2.0				
Maryland.									
Cumberland.....	Alleghany.....	69.5	17	70.2	+0.7	74.0	1874	65.0	1876
Massachusetts.									
Somerset.....	Bristol.....	69.3	18	69.8	+0.5				
Newburyport.....	Essex.....	64.7	10	65.8	+1.1	68.2	1883	59.4	1881
Worcester.....	Worcester.....	65.8	50	66.1	+0.3				
Michigan.									
Thornville.....	Lapeer.....	68.1	12	68.9	+0.8				
Kalamazoo.....	Kalamazoo.....	67.7	13	68.9	+1.2				
Adrian.....	Lenawee.....	66.6	11	69.4	+2.8				
Nevada.									
Carson City.....	Ormsby.....	64.5	9	61.0	-3.5				
New Jersey.									
South Orange.....	Essex.....	69.4	18	69.1	-0.3	73.6	1876	63.4	1881
New York.									
Factoryville.....	Tioga.....	66.1	7	67.0	+0.9	68.9	1887	62.3	1885
Palermo.....	Oswego.....	65.5	35	64.9	-0.6	71.6	1870	59.4	1855
Humphrey.....	Cattaraugus.....	64.3	6	65.0	+0.7	66.2	'84-'87	61.1	1886
Ohio.									
Napoleon.....	Henry.....	70.5	5	70.3	-0.2				
Wauseon.....	Fulton.....	68.4	18	69.3	+0.9	72.3	1873	65.5	1881
Yellow Springs.....	Greene.....	69.1	4	70.9	+1.8	70.9	1888	68.0	1885
Oregon.									
Albany.....	Linn.....	61.5	10	61.0	-0.5	64.0	1883	59.1	1880
Eola.....	Polk.....	60.0	18	59.2	-0.8				
Pennsylvania.									
Dyberry.....	Wayne.....	64.5	22	63.0	-1.5	69.4	1870	60.4	1881
Grampian Hills.....	Clearfield.....	66.3	24	67.3	+1.0				
Wellsborough.....	Tioga.....	67.6	10	65.5	-2.1	74.3	1883	61.2	1881
South Carolina.									
Stateburg.....	Sumter.....	76.3	8	76.5	+0.2	80.5	1881	72.4	1884
Tennessee.									
Milan.....	Gibson.....	74.0	6	74.0	0	86.0	1886	62.0	1883
Texas.									
New Ulm.....	Austin.....	80.4	16	78.4	-2.0	85.0	1881	78.2	1877
Vermont.									
Strafford.....	Orange.....	65.4	14	68.3	+2.9	69.0	1876	58.4	1881
Virginia.									
Bird's Nest.....	Northampton.....	74.4	19	73.5	-0.9	77.7	1880	70.2	1875
Variety Mills.....	Nelson.....	70.9	11	72.0	+1.1	73.3	1877	67.5	1878
Wytheville.....	Wythe.....	68.3	25	71.2	+2.9	73.0	1874	63.9	1878
West Virginia.									
Helvetia.....	Randolph.....	66.1	12	66.7	+0.6	69.7	1876	62.1	1878

TEMPERATURE OF WATER.

The following table shows the temperature of the sea-water for June, 1888, observed, under conditions as given, at the harbors of the several stations; the monthly range of water temperature; the average depth at which the observations were made, and the mean temperature of the air:

Station.	Temperature at bottom.				Mean temperature of air at the station.	Average depth of water in feet and tenths.
	Max.	Min.	Range.	Monthly mean.		
Canby, Fort, Wash.....	62.0	57.0	5.0	60.2	57.7	13.8
Cedar Keys, Fla.....	89.2	80.2	9.0	85.3	80.1	7.8
Charleston, S. C.....	84.5	77.5	7.0	81.0	78.2	34.7
Eastport, Me.....	44.7	41.0	3.7	42.9	54.7	16.5
Galveston, Tex.....	86.8	76.5	10.3	82.3	80.2	15.1
Key West, Fla.....	88.9	80.8	8.1	85.5	81.9	17.8
New York City.....	69.7	60.3	9.4	65.7	71.4	14.8
Pensacola, Fla.....	84.0	73.0	11.0	81.3	78.4	19.0
Portland, Me.....	57.5	48.1	9.4	52.3	63.0	15.4
Portland, Oregon.....	68.5	58.2	10.3	63.7	61.9	43.3

COTTON REGION REPORTS.

In the accompanying table are given for June, 1888, means of the maximum and minimum temperatures, and the average rainfall in the cotton regions, together with normals computed from similar observations of former years:

Temperature and rainfall data for the cotton districts, June.

Districts.	Rainfall.			Temperature.						Extremes for June, 1888.			
	Average for June of six preceding years.	Average for June, 1888.	Departures.	Maximum.			Minimum.						
				Mean for June of six pre- ceding years.	Mean for June, 1888.	Departures.	Mean for June of six pre- ceding years.	Mean for June, 1888.	Departures.				
										Max.	Min.		
	Inches	Inches	Inches.										
New Orleans.....	5.80	4.23	-1.57	90.6	89.2	-	1.4	70.2	68.0	-	2.2	99	47
Savannah.....	5.88	4.14	-1.74	89.9	90.7	+	0.8	69.4	67.9	-	1.5	102	54
Charleston.....	9.02	3.91	-2.40	88.6	90.9	+	2.3	67.2	68.2	+	1.0	98	51
Atlanta.....	5.27	3.91	-1.36	87.4	88.3	-	0.9	65.9	66.8	+	0.9	102	49
Wilmington.....	4.51	3.19	-1.32	87.4	86.5	-	0.9	65.1	66.9	+	1.8	102	49
Memphis.....	5.32	4.27	-1.05	87.6	86.5	-	1.1	66.0	65.9	-	0.1	98	46
Galveston.....	2.72	7.77	+5.05	92.0	88.7	+	2.3	70.2	71.4	+	1.2	104	58
Vicksburg.....	4.99	3.24	-1.75	90.1	88.6	+	1.5	69.2	67.8	+	1.4	95	54
Montgomery.....	4.85	3.90	-0.95	89.4	89.5	+	0.1	67.4	68.0	+	0.6	98	58
Augusta.....	5.32	2.21	-3.11	89.0	90.0	+	1.0	66.3	67.5	+	1.2	100	52
Little Rock.....	3.02	5.18	+2.16	89.0	87.2	-	1.8	65.7	67.0	+	1.3	102	48
Mobile.....	4.62	5.56	+0.94	91.1	92.2	+	1.1	65.7	67.9	+	2.2	102	48

* Average for five years.

It will be seen from the above table that in nine of the twelve districts for which means are given, the rainfall was below the average, and that the deficiencies exceeded two inches in the Charleston, Wilmington, and Augusta districts. In the remaining districts there was an excess, that for Galveston being unusually large.

No marked deviations from normal temperature conditions are shown by the above record.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for June, 1888, as determined from the reports of about one thousand stations, is exhibited on chart iv. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departures from the normal. The figures opposite the names of the geographical districts in columns for mean temperature, precipitation, and departures from the normal, show respectively the average for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal, and subtracting when above.

In the west Gulf states, Rio Grande Valley, over the northern districts from Minnesota westward to the Pacific coast, and in

northern California the rainfall of June, 1888, was in excess of the average. In all other portions of the country the rainfall was below the average. The percentages of excess were greatest in the northern and middle Pacific coast regions, where more than three times the average amount of rain fell, while more than double the average fell in the extreme northwest and northern plateau. In the west Gulf states there was also a marked excess, amounting to about 75 per cent. of the June average for that district. In the east Gulf states the excess was very slight. the rainfall amounted to less than half of the June average in the following named districts: New England, south Atlantic states, Florida, southern plateau, and south Pacific coast region, the normal for these two last named districts for June being about 0.50 and 0.10, respectively. The